

What is claimed is:

1. A method to control a distance between a chip die and a substrate, the method comprising:

coupling at least one spacer to the chip die or the substrate; and

bonding the chip die to the substrate, such that the spacer substantially defines the distance between the chip die and the substrate.

2. A method as defined in claim 1, wherein the at least one spacer comprises at least one of a stud, a ball, a gold stud, a trapezoid, a leg, a post, a blob, a wedge, or a brace.

3. A method as defined in claim 1, wherein an end of the at least one spacer is flattened.

4. A method as defined in claim 1, wherein the at least one spacer has a core and a solder covering.

5. A method as defined in claim 1, wherein the chip die comprises a flip chip die.

6. A method as defined in claim 5, wherein bonding the flip chip die to the substrate optically couples an optical element of the flip chip to a waveguide mounted on the substrate

7. A method as defined in claim 1, wherein the substrate comprises at least one conductive pad coupled to its surface.

8. A method as defined in claim 7, wherein the at least one conductive pad is a solder pad.

9. A method as defined in claim 1, wherein bonding the die to the substrate comprises creating a solder joint between the at least one spacer and the substrate.

10. A method as defined in claim 9, wherein the solder joint between the spacer and the substrate creates an electrical connection between the chip die and the substrate.

11. A method as defined in claim 1, wherein bonding the chip to the substrate comprises thermocompression bonding the chip to the substrate.

12. A method to mount an optical flip chip die comprising:
establishing a distance between the optical flip chip and an optical waveguide;
coupling at least one spacer to the substrate or the flip chip die; and
thermocompression bonding the at least one spacer to at least one conductive pad on the optical flip chip die or the substrate.

13. A method as defined in claim 12, wherein the at least one spacer comprises at least one of a stud, a ball, a gold stud, a trapezoid, a leg, a post, a blob, a wedge, or a brace.
14. A method as defined in claim 12, wherein the distance between the optical flip chip and the optical waveguide comprises a distance that substantially maximizes an optical coupling between the optical flip chip and the optical waveguide.
15. A method as defined in claim 12, wherein the at least one spacer has a core and a solder covering.
16. A method as defined in claim 12, wherein the core has a first melting point, the solder covering has a second melting point, and the first melting point is greater than the second melting point.
17. A method as defined in claim 12, wherein the thermocompression bonding creates an electrical connection between the optical flip chip and the substrate.
18. An optical package comprising:
 - a die;
 - a substrate; and
 - a spacer structured to separate the die and the substrate at a

predetermined standoff height.

19. An optical package as defined in claim 18, further comprising:

a conductive pad operatively coupled to one of the substrate and die;

and

a bond to couple the spacer to the conductive pad to create an electrical connection between the substrate and the die.

20. An optical package as defined in claim 19, wherein the bond is a thermocompression bond.

21. An optical package as defined in claim 19, wherein the conductive pad is a solder pad.

22. An optical package as defined in claim 19, wherein the spacer comprises at least one of a stud, a ball, a gold stud, a trapezoid, a leg, a post, a blob, a wedge, or a brace.

23. An optical package as defined in claim 18, further comprising a waveguide mounted on the substrate, the predetermined standoff height being selected to promote optical coupling between the die and the waveguide.

24. An optical package as defined in claim 18, wherein the die comprises an optical flip chip die.